

Section IV. REMARKS

Amendments to the Specification

The specification has been amended herein to overcome the objections to the specification set out at page 2, paragraphs 1 and 2 of the January 3, 2005 Office Action.

Additionally, in the specification paragraphs on pages 25 and 26 containing trademarks, the trademarks have now been set out in the specification in capitalized form, with generic terminology and source information for the specified products. No new matter (35 USC § 132) has been added.

In response to the Examiner's requirement of a new Abstract of proper length and narrative form, an amended Abstract has been furnished on a separate page at the end of this response, and the amended Abstract is also set out in appropriate form in Section I hereof.

In response to the Examiner's objection to the first paragraph of the disclosure, amendment has been made to include the current status of the parent application, as required by the Examiner.

Acknowledgement of Allowance of Claims 22-27, 51-53 and 56

The allowance of claims 22-27, 51-53 and 56 in the January 3, 2005 Office Action is acknowledged with appreciation.

Rewriting of Prospectively Allowable Claim 20 in Independent Form

Consistent with the Examiner's statement in paragraph 8 at page 3 of the January 3, 2005 Office Action, that claim 20 would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims, claim 20 has been rewritten in independent form, and therefore is now in condition for allowance.

Rejection of Claims on Reference Grounds, and Traversal Thereof

In the January 3, 2005 Office Action, claims 19 and 21 were rejected under 35 USC 102(b) as anticipated by Lee U.S. Patent 5,460,745 (hereafter "Lee").

Such rejection is traversed in light of the following remarks in support of the patentability of claim 19 herein, which thereby correspondingly establish the patentability of claim 21 dependent thereunder.

Patentable Distinction of Claim 19, and Claim 21 Dependent Thereunder, Over Lee

Claim 19 is set out below for ease of discussion.

**19. (Original) A method of making a porous metal matrix, including the steps of:
providing fine metal particles comprising a Group VIII or Group IB metal; and
sintering said fine metal particles to form the porous metal matrix.**

Considering the metals recited in the claim, the Group VIII metals are iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum. The Group IB metals are copper, silver and gold.

Sintering, as such term is used in the art, refers to the bonding of particles that have been compacted, in which the bonding is effected at elevated temperature in the vicinity of, but less than, the melting point of the particulate material.

See, for example, http://cybercut.berkeley.edu/mas2/html/processes/sinter_pressure/ (visited April 4, 2005; copy attached in Appendix A hereof):

"Sintering occurs in a controlled-atmosphere furnace where the green piece (piece straight from compaction) is heated to a temperature close to but not at melting. This is done so that particles may bond by solid state bonding, but not melt."

Lee, in contrast to the process of claim 19, discloses a process that does not involve sintering, and Lee in fact teaches away from the process of claim 19, in the explicit teaching of maintaining metal particles in particulate – i.e., non-bonded – form.

The Examiner has cited Lee for disclosure at column 6, lines 3-23 of “a particulate hydride composition containing La, Ni and Al that is provided and maintained at 120°C” (paragraph 5, page 2, January 3, 2005 Office Action).

Lee is directed to a “composition for use in storing hydrogen, and a method for making the composition” (Abstract, lines 1-2). Such composition “comprises a mixture of two or more hydrides, each hydride having a different series of hydrogen sorption isotherms that contribute to the overall isotherms of the mixture” (Abstract, lines 2-5).

Lee specifically teaches at column 8, lines 1-3 that “[T]o increase the efficiency of hydrogen absorption/desorption, the surface area of composition 42 [see FIGS. 5A and 5B of the patent] is maximized by supplying the composition in the form of small particles.”

Thus, Lee uses the multi-hydride composition for hydrogen storage and dispensing in the form of small size particles, and indeed, Lee at column 8, lines 3-11 discloses that since “the particle size is reduced with each adsorption/desorption cycle,” fine mesh screens are utilized “to substantially prevent escape of hydride fines from housing 22,” thereby unequivocally establishing that the particulate form of the multi-hydride composition is maintained in the subsequent use of the composition for hydrogen storage and dispensing.

Such maintenance of the particulate form of the multi-hydride composition is logical, since the surface area thereby is maximized for adsorption/desorption of hydrogen, and it is likewise self-evident that any bonding of particles to one another would diminish the surface area of the composition that is available for sorption/desorption, reducing the suitability of the Lee composition for its intended purpose. The express purpose of Lee is “maximized” surface area, achieved by “small particles” (column 8, lines 1-3).

Further, the disclosure in Lee cited by the Examiner at column 6, lines 3-23 shows that the Lee reference teaches away from the applicants' invention. That disclosure of Lee utilizes two different lanthanum-nickel-aluminum alloys in a bed maintained at temperature of 120°C, a temperature that is not in any way suitable for or effective to produce particle bonding of such material – the melting point of lanthanum is 2250-2307°C so sintering of such metal would have to take place at temperature near to but less than such melting point, while sintering temperatures for nickel typically exceed 700°C, and those of aluminum sintering temperatures are typically on the order of 600°C or higher. Instead, it is apparent that the temperature of 120°C in the cited passage of Lee at column 6, lines 3-23 is the temperature at which the hydrogen sorption/desorption is taking place in the bed (“bed ... maintained at a temperature of approximately 120°C... hydrogen (H₂) was admitted into the hydride bed and allowed to equilibrate”).

As is apparent from the foregoing, there is no derivative basis in Lee for the applicants' claimed invention as broadly recited in claim 19, and Lee in fact teaches away from such claimed invention.

Claim 19 is accordingly patentable over Lee, as is claim 21 of dependent form thereunder.

Fee Payable for Rewritten Claim 20

The rewriting in independent form of claim 20 herein, thereby increasing the number of independent claims by one beyond the number in excess of three for which payment has previously been made, entails a fee of \$200 (37 CFR §1.16(h)).

This fee of \$200 for rewritten claim 20 is enclosed in the form of a Credit Card Authorization Form in such amount. Authorization also is hereby given to charge the amount of any deficiency or other fee(s) properly payable in connection with the filing of this response to the January 3, 2005 Office Action, to Deposit Account No. 08-3284 of Intellectual Property/Technology Law.

CONCLUSION

Claims 19-27, 51-53 and 56 as now pending in the application, are patentable and in form and condition for allowance. Issue of a Notice of Allowance for the application therefore is respectfully requested.

If any issues remain outstanding, incident to the formal allowance of the application, the Examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss same, in order that this application may be allowed and passed to issue at an early date.

Respectfully submitted,



Steven J. Hultquist
Registration No. 28,021
Attorney for Applicants

INTELLECTUAL PROPERTY/
TECHNOLOGY LAW
P. O. Box 14329
Research Triangle Park, NC 27709
Phone: (919) 419-9350
Fax: (919) 419-9354
Attorney File: 2771-469 DIV (7487)